LOADING THE CLIMAX BASKET

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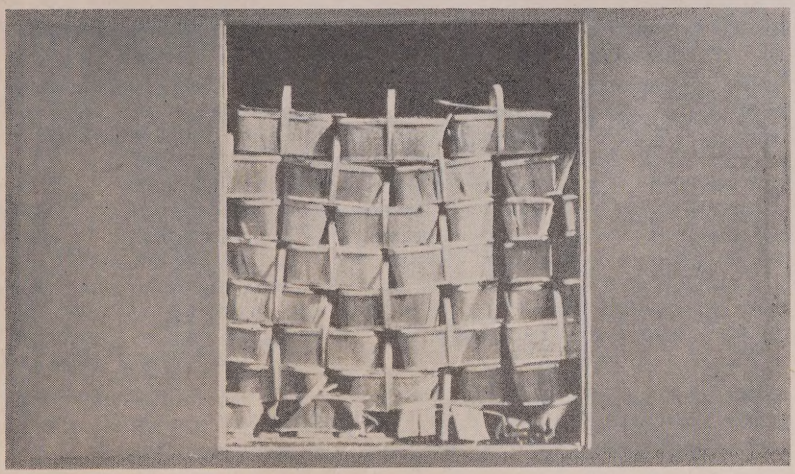

One kind of national waste

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FOR LONG DISTANCE CARLOAD MOVEMENTS

Observations of the tender fruit traffic from Ontario points bring out two important but conflicting facts regarding the Climax basket—it is a good seller but a poor loader and carrier. If it reaches its destination in good condition it displays its contents to advantage, but it does not lend itself to any loading method that will provide for refrigerated air movement through the load.

Six-quart and eleven-quart Climax baskets carry cherries, tomatoes, plums, prunes, pears, peaches and grapes, also some early apples and vegetables, in straight and mixed cars, frequently with both sizes of baskets in the same car.

Present Loading Methods

Perhaps for the reason that cars are usually loaded straight from the trucks, with mingled sizes of baskets and kinds of fruit, loading usually commences across the car ends and meets at the doorway. In some cases doorway spacing is maintained but the practice is not general. Many shippers contend that if cars are loaded in longitudinal rows some crosswise slack is unavoidable, and that in transit the weaving or side-to-side rocking of the car increases this slack and develops a rocking motion of the load which eventually breaks down the baskets in the lower levels.

Nevertheless the practice is open to criticism for the reason that loaders working across the car, and impressed with the importance of getting the load tight crosswise, usually squeeze the rows unduly tight, getting

Over-tight Loading

15 sixes in a row where, for instance, 14 sixes leave no undue slack. The very act of getting the extra basket squeezed in will often leave some slight end-to-end slack, and placing the next row will not remove it. It is true that the car's capacity at the same depth is increased, but crosswise spacing tighter than is necessary to avoid sideway results in a load that is little better than a solid mass over the false floor.

End-to-end loading and doorway spacing and bracing takes care of any slack in either direction. There is not the same probability of end-to-end slack when the baskets are placed snug, and driving the spreaders in between the centre gates (see Figs. 7 and 8) takes up any slack remaining.

Spaced and Braced Doorways

This discounts the probability of any crosswise slack developing. With end-to-end loading there is not the same opportunity or tendency to squeeze the crosswise rows. A snug load across the car can very well be made, when it is a toss-up between squeezing in an extra basket and leaving dangerous slack, by placing the wall row diagonally, as illustrated in Figs. 1 and 2. A diagonal row takes up about three-quarters of the width of two baskets, has a binding effect against end-to-end "chucking," and has the additional merit of providing excellent ventilation along that wall of the car.

Loading with both sizes of baskets always presents difficulties. When all of one size can be received first and either squared off in a block across one end, as in Fig. 8, or in complete end-to-end rows, the difficulty is minimized. But where the practice prevails of making up a loading sheet for each car and sending the fruit to its car as it arrives, mixed kinds and sizes, the loader may do the best he can and still have dangerous slack and unevenness in his finished load.

Mixed Sizes Baskets

It is not intended with these remarks to decry crosswise loading, but only the tendency to overcrowd the crosswise rows while giving less attention to the greater danger with end-to-end slack. What is attacked is the practice of filling the doorway, which has two evils—(*a*) some end-to-end slack will be left, however carefully the baskets are placed, and (*b*) some centre space is very necessary to encourage the at best insufficient air circulation. To emphasize the importance of avoiding any end-to-end slack is worth repetition. As the load grows from each end towards the middle the total of the lost fractions of inches increases. Then the load is often completed at the doorway by bridging a few more waste inches, an exaggerated case illustrated in Fig. 3. Fig. 4 shows the probable outcome of such loading after the car "chucked" a few times; the bottom baskets hold on any floor unevenness and are crushed by the shifting and weight of the baskets above. Fig. 5 is another example of the result of end-to-end slack in which crosswise baskets contributed to the damage and their own destruction.

End-to-end Slack makes "Chucking" Damage Possible

False flooring provides a space under the load the entire length of the car. Chilled air from the car ends flows into this space and filters upward through the load, according to its density, following the rise of heat-carrying air which completes the cycle by moving to the ends of the car. This circulation carries heat from the load to the ice where the ice absorbs the heat or the heat melts the ice, it may be expressed either way. The important fact is that there must be air circulation to carry the heat to the ice, and the freer that circulation is the more heat will be carried away and the more ice melted. The mere presence of the ice accomplishes nothing, it must melt to benefit the load. The purpose of the false flooring is overlooked if it is covered with a load without breathing space.

Provide for Air Movement Through the Load

The situation facing shippers is that the Climax basket is subject to damage by shifting if loaded loose enough to provide anything approaching sufficient ventilation through the load and is equally subject to deterioration by insufficient refrigeration if loaded compact enough to stand ordinary handling in train and yard movements.

Two Evils

In September, 1925, temperature comparisons were made of two cars of grapes from St. Catharines to Winnipeg, one loaded solid and the other with the doorway spaced and braced. U.R.T. 82300, the longer car of the two, with 2,501 six-quart baskets, 21,260 pounds, loaded eight high and left nearly the whole doorway clear. Resistance thermometers were placed as this car loaded. N.Y.D.X. 14524 was a solid load throughout with 2,363 six-quart baskets, 20,000 pounds, also eight deep. This car was just as much shorter as the unoccupied space in the doorway of the longer car. Three thermographs were placed as loading completed, No. 1 replacing a basket on top of the load centred between the doors, No. 2 one-third back or eight rows from the bulkhead, and No. 3 two-thirds back or four rows from the bulkhead. These positions were comparable

1925 Tests

with top-load resistance thermometers in U.R.T. 82300, designated A, B and C respectively in the table below, A being the same distance from the ice as No. 1 but in the last row against the doorway bracing instead of centred between the doors over solid load:

—	No. 1	"A"	No. 2	"B"	No. 3	"C"
Grimsby.....11.15 p.m.	60·0	57·8	60·0	60·4	60·0	61·0
Allandale..... 6.15 a.m.	57·5	52·0	58·0	57·0	56·5	57·6
Washago.....12.00 noon	56·0	48·8	57·0	55·0	55·0	55·0
Parry Sound..... 4.30 p.m.	55·0	46·6	56·0	52·6	53·5	55·0
Capreol.....12.30 a.m.	53·5	44·6	54·5	49·8	51·0	54·8
Foleyet.....12.15 p.m.	49·0	41·6	50·5	45·6	46·5	50·2
Horne Payne.....10.30 p.m.	48·5	40·8	49·5	44·0	46·0	46·2
Nakina.....11.00 a.m.	46·0	40·2	47·0	42·0	44·0	43·0
Armstrong..... 5.30 p.m.	45·5	39·8	46·0	41·6	43·0	42·6
Sioux Lookout..... 4.00 a.m.	43·5	39·6	44·5	40·8	41·5	41·8
Redditt..... 1.30 p.m.	43·5	39·4	44·0	40·4	40·5	41·4
Transcona..... 8.00 p.m.	43·5	39·4	44·0	40·2	40·5	41·0
Average for comparison.....	50·2	44·2	51·0	47·5	48·2	49·1

This information is graphed in Fig. 6 with lines showing the relative top-of-load temperatures at noon of the four days in transit. The record of thermometer "D" at the bulkhead of the spaced car is shown as well, and it is a matter of regret that a fourth thermograph was not available for the top-load bulkhead position in the solid loaded car. This diagram shows that in the spaced car the top-load doorway temperature was at all times slightly better than at the bulkhead even, proving that if ample circulation is provided the packages nearest the door need not suffer because of distance from the ice. Unfortunately without a fourth thermograph in the position nearest the ice in the solid loaded car that temperature can only be surmised, but it would be the lowest in that car. Solid loading does not encourage circulation of chilled air towards the car centre and the result is better temperatures nearest the ice.

Spaced Car Had Better Temperature Towards Doorway

It will be noticed that at "C" in the spaced car the temperature dropped very slowly during the first 24 hours, then tumbled suddenly. The only explanation offered is that at this position in the car every row was squeezed to 15 wide, but not farther towards the door; a slight difference in baskets arriving later made it over-difficult to squeeze 15 in, in fact 14 wide was a comfortable fit. It probably happened that these over-tight rows shook down a little and permitted freer air filtration upward through the load. It will be noticed also that in the solid car No. 1 thermograph between the doors showed a slightly better temperature than No. 2 three rows nearer the ice. A reasonable explanation is that the load was much looser between the doors, had at least four inches of slack when finishing off at the doorway, while at No. 2 the load was a tight pack. These incidental records argue against the over-eight load.

Evidence of Over-tight Loading

Comparing Transit Icings

Ice consumption in transit in these two cars offers an interesting comparison, as follows:—

	NYDX 14524 (solid)	URT 82300 (spaced)
	lbs.	lbs.
Initial Icing—		
Grimsby..... 9.30 a.m. 24th	6,000	10,000
Transit Icings—		
Grimsby..... 11.15 p.m. 24th	2,000	2,000
Allandale..... 7.00 a.m. 25th	1,900	2,500
Capreol..... 1.00 a.m. 26th	1,400	1,000
Horne Payne..... 11.15 p.m. 26th	900	1,500
Armstrong..... 5.30 p.m. 27th	750	700
Sioux Lookout..... 4.00 a.m. 28th	425	360
Total re-icing.....	7,375	8,060
Re-iced per cubic foot.....	4·00	3·94
Re-iced per 6-qt. bskt.....	3·12	3·22

This fruit loaded in comparatively cool weather with fruit temperatures 60° to 62° and moderate weather and cold mornings prevailed to destination.

The details of these two cars argue strongly for the spaced doorway. Additional argument would be impressed on any shippers who could observe the arrival of their cars at Winnipeg. It frequently happens that marketing conditions there make it desirable to divert cars to a stronger demand farther West. Before doing this the consignee or broker makes an inspection, if possible, to assure himself that the contents will stand diversion. With a solid loaded car he can examine only a few baskets on top at the doorway without climbing up and over the load. If he confines his inspection to what he can reach from the door-sill he sees the poorest refrigerated fruit in the car, according to thermograph No. 1 in car 14524. If he or his customer wants to see more than that he must and does climb up and over the load and pass baskets forward to the doorway for inspection. Some damage is inevitable. Inspection of a car with a spaced doorway is much easier. A considerable portion of the top load is within reach. Also, according to thermometer "A" in car 82300, the fruit in nearest reach has had good refrigeration and is more likely to "sell" the car.

Destination Inspection

Beyond illustrating the temperature advantages towards the doorway with spaced cars this bulletin introduces little that is not general knowledge among shippers experienced with the Climax basket. Its faults are generally known. Thoughtful shippers everywhere have pondered over ways and means of improving its handling without too much loss of time after the baskets are all in and without undue material expense, but there is an unfortunate tendency to look for a profit by economy in transportation costs, to leave something to chance rather than to practice thoroughness in loading precautions. Car capacity figures as well; no shipper cares to load less than the billing minimum.

Tendency To Gamble

Our recommendations take into account the very considerable reduction in the transportation hazard with cars loaded to accelerate refrigeration, and the practical certainty that the investment in time and material will multiply and return in the price realized at destination. We recommend loading from the ends toward the door, while admitting that equal satisfaction is possible with cross-wise loading if overcrowding is avoided; in either case the load would be squared off at the doorway leaving about half its width clear to be gated and braced. We recommend that the load be built snug crosswise, but not over-tight, with

Recommendations

diagonal loading of the last wall row where necessary instead of either squeezing or risking slack. The doorway bracing will eliminate any end-to-end slack.

Doorway Bracing

A load of Climax baskets may be braced with lighter material than is required for a car of crates or boxes, since with a solidly built load the handles have a binding tendency. Figs. 7 and 8 illustrate a braced doorway. The open centre encourages an outward flow of chilled air, the return movement carrying away the heat rising from the load. One by six material across the load and two by fours for legs and spreaders gives sufficient strength if ordinary care is used in its construction and placing. See Fig. 9. At least one leg on each side should be the full height of the car less one-half inch, otherwise in rough handling the whole structure may jump and collapse. The spreaders should be driven into place after being cut long enough to take up all probable end-to-end slack. There will be six inches or more slack in a well built load of baskets.

Fig. 1—Shows detail of diagonal loading, recommended instead of squeezing the crosswise rows. Note how freely air can move at this wall.

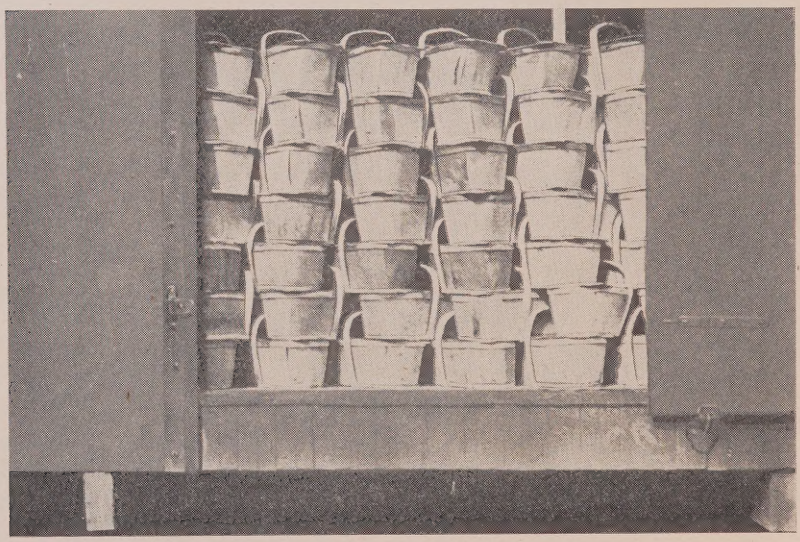

Fig. 2—Shows the diagonal row at the doorway; leaves no slack but does allow for air circulation.

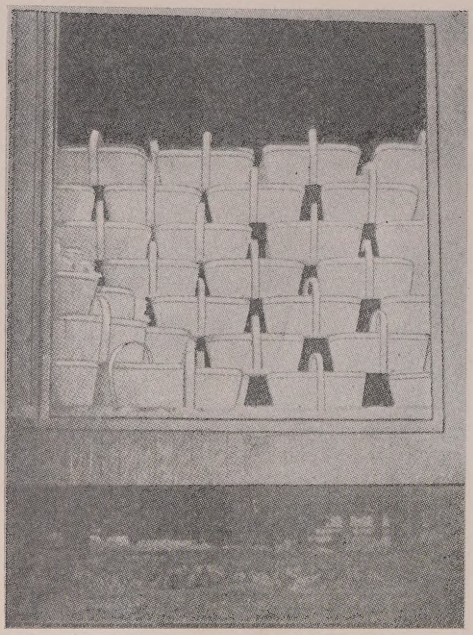

Fig. 3—Bridging the extra inches like this invites disaster; it can be avoided even with end-to-end loading, and better still with centre bracing.

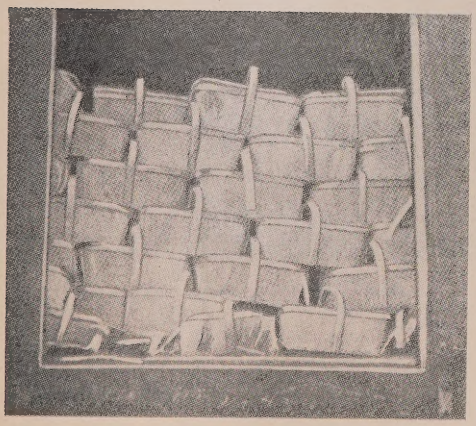

Fig. 4—Slack loading permitted "chucking" in the car, which probably started out looking like Fig. 3. A few minutes were saved and many dollars lost.

Fig. 5—The loader must have had reasons for placing so many baskets crosswise in this doorway, but they weren't good reasons; they acted as rockers when the load end-shifted. Doorway bracing would overcome this difficulty.

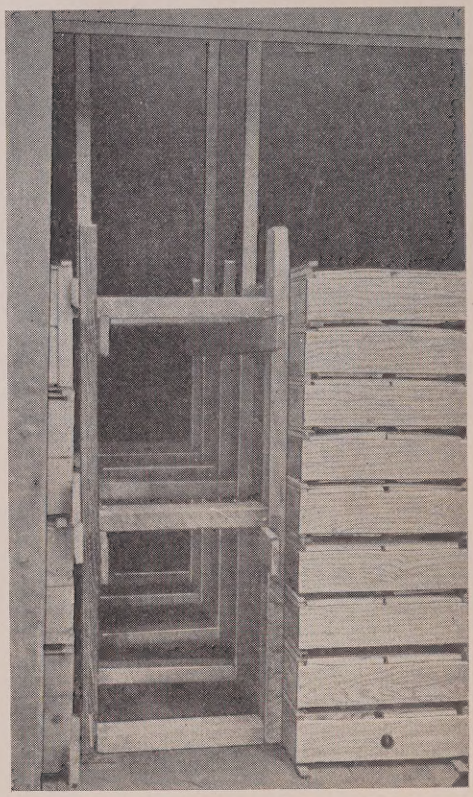

Fig. 7—Shows a well braced doorway, heavier than would be necessary with baskets (see closing paragraph.)

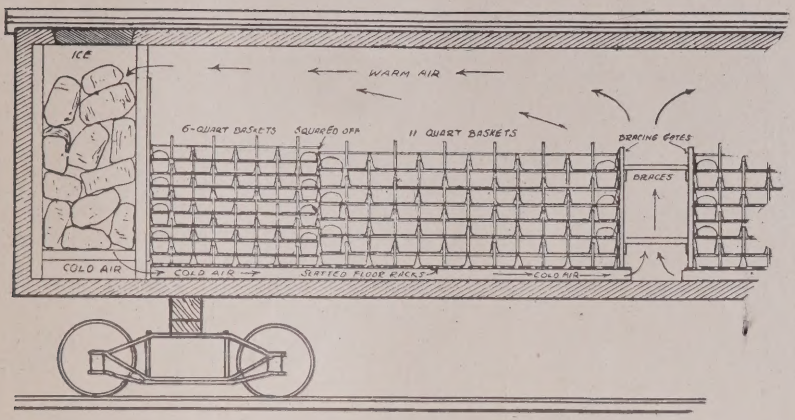

Fig. 8—Illustrates spaced and braced doorway and direction of air circulation.

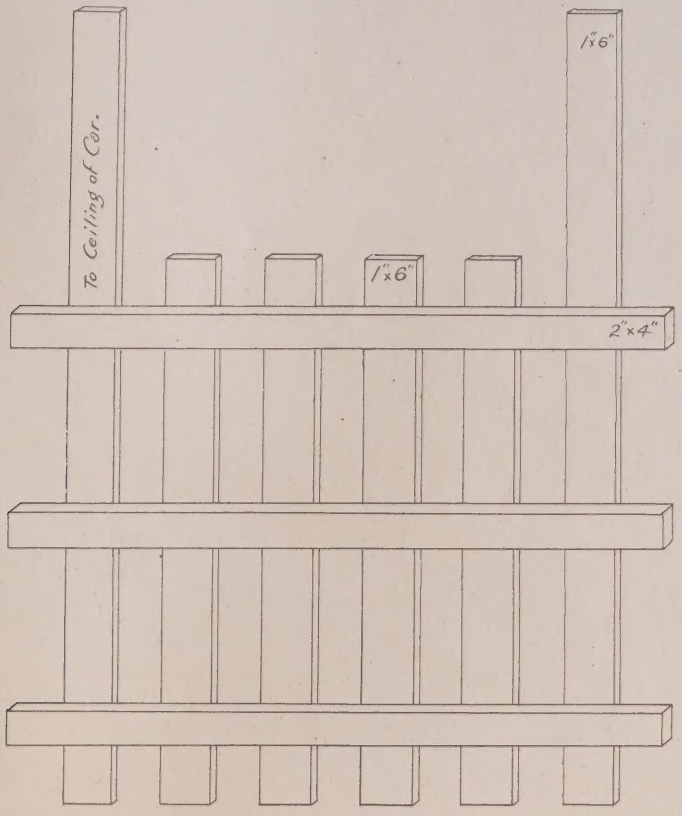

Fig. 9—Shows a type of centre gate suitable and heavy enough for baskets. (See closing paragraph.)

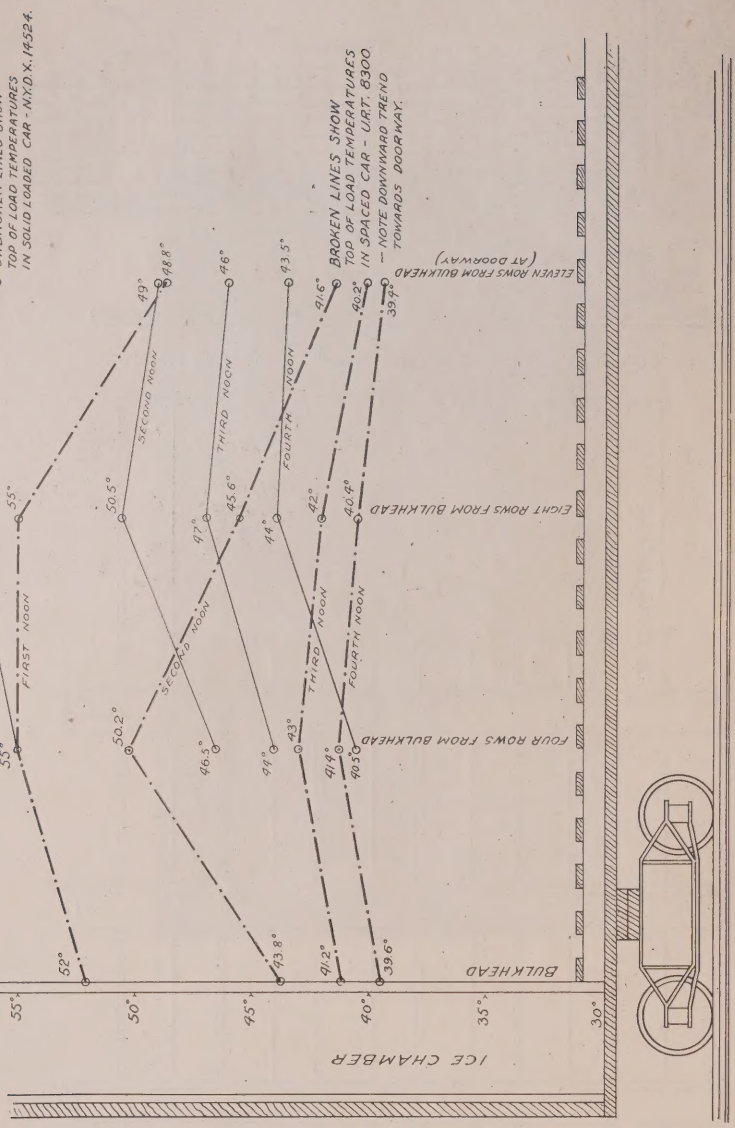

Fig. 6—Compares the top of load temperatures in two cars at noon of four consecutive days, showing worst refrigeration near the door in NYDX 14524, loaded solid, while in URT 82300 loaded with the doorway spaced and braced the doorway temperatures compared favourably with those nearest the ice.

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